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# ENDANGERED SPECIES TECHNICAL BULLETIN

Department of the Interior • U.S. Fish and Wildlife Service • Endangered Species Program, Washington, D.C. 20240

## Hawaiian Bird Survey Yields Mixed Results

In the tangled rainforest on the flanks of Mauna Loa, Fish and Wildlife Service teams of birdcounters have discovered substantial populations of Hawaii's Endangered akepa **(Loxops coccinea coccinea)** and creeper **(Loxops maculata mana)**.

Preliminary results of the three-month survey this past summer—the first systematic count of forest birds on the island of Hawaii—indicate there may be between 4,000 and 8,000 akepa and at least 1,000 creepers in the rugged upper elevations of Ka'u Forest.

The teams were not as fortunate with another Endangered bird, the akiapolaau **(Hemignathus wilsoni)**. The count fell below team expectations, totaling just a few hundred.

The io, or Hawaiian hawk **(Buteo solitarius)**, is an Endangered bird that constitutes the only endemic hawk throughout the Hawaiian Islands. Some io were spotted by the census takers; the hawks were rather uniformly distributed and somewhat more common at lower elevations in closed-canopy areas.

The highest elevations of the island produced sightings of the nene, or Hawaiian goose **(Branta sandvicensis)**. The teams saw two young of this Endangered species.

The alala, or Hawaiian crow **(Corvus tropicus)** was heard but not seen. The teams heard a total of four alala, but were not able to make any sightings. It is possible that this Endangered species occurs in the forest areas only as a transient. The total number of alala is believed to be less than 50.

The ou **(Psittrostra psittacea)**, once found on several islands, is now limited to the islands of Hawaii and Kauai. The Hawaii survey, however, did not produce any sightings; consequently the ou currently may rank as the rarest of the island of Hawaii's Endangered forest birds.

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## FINAL RULEMAKING LISTS 26 PRIMATES; RULES ENCOURAGE CAPTIVE BREEDING

A final rulemaking, scheduled to go into effect on November 18, lists a total of twenty-six primates (twelve Endangered and fourteen Threatened) on three continents.

This rulemaking is unique in that it also contains special provisions designed to encourage captive breeding of the listed primates to provide specimens for medical research, zoo display, and other specific purposes.

### Distribution

Ten of the listed primates are native to Asia. One of them, Francois' leaf monkey **(Presbytis francoisi)**, is listed as Endangered; the rest are Threatened species.

Eleven species are native to Africa. Eight are listed as Endangered, including the drill **(Papio leucophaeus)** and the mandrill **(Papio sphinx)**. The three Threatened species are the Gelada baboon **(Theropithecus gelada)**, the chimpanzee **(Pan troglodytes)**, and the pygmy chimpanzee **(Pan paniscus)**.

Five listed primates are native to Latin America. Two are Threatened; three are Endangered—including the cotton-top marmoset **(Saguinus oedipus)**.

(For complete information on the names, distribution, and status of the twenty-six species, see the accompanying table on page 3 of the TECHNICAL BULLETIN.)

(continued on page 4)

—SMITHSONIAN INSTITUTION

*West African chimpanzee, Threatened*

### *WPO Assumes Permit Duties*

*The recently created Federal Wildlife Permit Office (WPO) has assumed licensing responsibilities formerly held by the U.S. Fish and Wildlife Services' Division of Law Enforcement.*

*As of November 15, WPO received the authority to issue, modify, suspended, and revoke permits and exemptions for import/export of wildlife at nondesignated ports, feather import quotas, injurious wildlife, Endangered and Threatened species, marine mammals, and migratory birds. Direct Inquiries and permit applications to U.S. Fish and Wildlife Service, Wildlife Permit Office, Washington, D.C. 20240.*

## Treaty Nations Meet

Representatives of 32 member nations of the Convention on International Trade in Endangered Species of Wild Flora and Fauna held their first biennial conference on November 2-6 in Berne, Switzerland. The U.S. delegation was headed by Deputy Assistant Secretary of the Interior Curtis Bohlen.

The conference focused on such issues as the implementation and enforcement of Convention restrictions, amendments to the list of species on the three appendixes to the treaty negotiated in 1973, and establishment of uniform import-export documents.

A full report on the actions taken at the conference will be published in the next issue of the BULLETIN.

## Condor (continued from page 4)

this egg as they had been to their previous one. Consequently, the period of incubation was irregular. On May 29, the researchers found the egg broken.

In 1975 the researchers observed some courtship or aggressive interactions between adult birds in adjoining enclosures. Visual barriers were subsequently installed between the enclosures to curtail this activity. Use of the barriers may have been a contributing factor in the successful breeding of two more sets of paired birds later that year.

Each of the three pairs produced an egg, and all three eggs hatched. Two chicks survived. In 1976, three eggs were laid, two eggs hatched, and one chick survived.

### Third Stage

Having successfully solved the problems of caring for the birds and inducing mating in captivity, the Patuxent researchers currently are producing stock for the experimental introduction of captive-bred young to the wild in South America. However, implementation of the third stage of the program—transplantation—is still several years away, in that the condor is a slow-maturing bird.

As yet, techniques have not been developed for this third and most important phase of the program. In the meantime, though, consideration is being given to a possible field study, using turkey vultures and black vultures, to determine the optimum age for release to the wild.

Another study plan now being considered is the simulation of a nest/roost setting in the wild, together with development of a hacking plan similar to that used successfully for peregrine falcons (see July 1976 issue of the BULLETIN).

### Overview

As of late 1976, the condor program at Patuxent has produced a total of ten eggs in five years. Six of the eggs have hatched, and four young condors have survived.

Including the four young birds, there are a total of twelve condors now in residence at Patuxent.

### The Critical Factor: Time

Ten years of work at Patuxent have demonstrated that time is the major constraint on the captive breeding of these slow-maturing, long-lived birds.

A decade or more may be needed for the birds to reach maturity and form stable pair bonds. Then, after breeding has been accomplished, 5-8 more years may be required for offspring to reach the optimum age for release in the wild. Consequently, the overall time period for all three stages of the Andean condor experiment may be as much as 15-20 years.

Furthermore, according to researchers, 5-10 more years may be needed to determine whether or not the released birds can successfully survive and reproduce in the wild.

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## Bird Survey (continued from page 1)

Given the comprehensiveness of the survey, it was felt that there was a slim chance that the survey teams would perhaps come across one of the birds presumed to be extinct on the island of Hawaii. These birds include, for example, the Hawaii oo **(Moho nobilis),** greater koa finch **(Pittrostra palmeri),** and grosbeak finch **(Psittrostra kona).** The teams had no such luck.

### Team Work

The survey was performed by two teams headed by J. Michael Scott and John L. Sinock, research biologists from the Hawaii field station of the Service's Endangered Species Program.

Each team included three temporary members, all of them graduate students or teachers with the dual qualities of being experts on Hawaiian birds and also being able to work well under adverse conditions.

Two of the team members were Tonnie Casey and James Jacobi, who together had discovered a new species of Hawaiian honeycreeper, the poo-uli **(Melamprosops phaesoma),** on the island of Maui in 1973.

The survey teams backpacked into Ka'u Forest, spending as much as eight days at a time in the field before packing out for a few days' rest. When in the field, they had to get up at 4 a.m. to start conducting their prearranged transects.

The concept of a team survey was developed in collaboration with the Hawaii forest bird recovery team. Previous surveys had been conducted by individual Service biologists; such surveys had revealed that one person working alone in such rugged country could not produce an adequate count.

In addition to counting birds, the two teams also sampled the phenology of plants on the island, characterized plants, and took samples of mosquitos.

The teams' interest in mosquitos stemmed from the fact that avian diseases transmitted by these insects (another form of life brought to the Hawaiian Islands by man) are believed to be a cause of the decline of Hawaii's honeycreepers. The birds have survived in the higher elevations, where they are safe from mosquitos and also from habitat destruction.

The large amounts of raw data gathered by the survey teams are now being processed by computer. The U.S. Forest Service has contributed funding for this phase of the study. In addition, supplies and equipment have been provided by Hawaii's State Division of Forestry and State Division of Fish and Game.

A second phase of the field study is scheduled to be undertaken next spring and summer. It will concentrate on the Hamakua forest area on the northeastern coast of the island of Hawaii. This area is three times larger than Ka'u Forest, and very little is known about its bird life.

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November 1976

SPECIAL REPORT
Birds of Hawaii

# RECOVERY EFFORT INTENSIFIES TO SAVE HAWAII'S ENDANGERED WILDLIFE

*Three individuals alone of the little Honey-eater remained on our arrival; these perished during a three-day gale that enveloped everything in a cloud of swirling sand.*
—Alexander Wetmore, 1924

One of the Fish and Wildlife Service's most intensive research and recovery efforts is being conducted in the Hawaiian Islands, where much of the native wildlife either has become extinct or is in danger of extinction.

Since the islands were first visited by Europeans some 200 years ago, 23 of the 67 known species and subspecies of endemic birds—birds that had taken thousands of years to evolve—have disappeared. Today, 29 of the remaining 44 kinds of native endemic birds are classified as Endangered and many are bordering on extinction.

Birds are not the only living things struggling to survive in Hawaii. The islands' only two endemic mammals—the Hawaiian monk seal and Hawaiian hoary bat—have declined to dangerously low populations.

Plants have also suffered. Approximately half of the 1,729 species of native seed plants were proposed earlier this year for listing as Endangered (see September 1976 issue of TECHNICAL BULLETIN). The Endangered birds are ecologically dependent upon native plants.

### Ecological Upheaval

The plight of Hawaii's wildlife is for the most part directly attributable to habitation by man—and more recently to the dramatic growth in the islands' population. These activities have eliminated much of the wetland habitat available for waterbirds.

Tremendous changes have occurred in the islands' unique ecology since the first Polynesian settlers arrived about 1,200 years ago. They brought with them dogs, pigs, fowl, rats, about two dozen kinds of food and fiber plants, plus an unknown number of weeds and insects. Large areas were cleared for agriculture, and over the years fires set either intentionally or accidentally destroyed thousands of acres of dryland forests on the leeward slopes.

But these changes were only a minor prelude to what happened after the second colonization of the islands began two centuries ago. Sea captains seeking to provide their crews with a source of fresh meat released cattle and sheep on the lush plains. In 1794, one captain got King Kamehameha to proclaim a 10-year kapu (taboo) on the killing of the imported animals by the common people. The kapu remained in effect until 1818. By then, the cattle and sheep, along with introduced horses, goats, and pigs, were multiplying rapidly in the absence of diseases and predators. Over the next century, they moved into virgin forests, slowly destroying them and the habitat of native birds.

When eradication of these feral animals finally began in 1921, they numbered in the hundreds of thousands. According to one report, 10,000 introduced mammals were killed every year from 1921 until 1946 in the forest reserves alone on the island of Hawaii. Goats, pigs, and sheep still abound on some of the islands.

The rats accidentally brought by the Polynesians and later by Western travelers proliferated. They were believed responsible for the extinction of populations of the Laysan rail and Laysan finch, which had been transplanted to Midway atoll earlier in this century. Rats also are believed to be major predators that raid the nests of seabirds and forest birds.

### *Birds of Hawaii Chart*

*A chart of the known endemic, indigenous, and migratory species of Hawaiian birds appears in the center pages of this Special Report.*

*The information was compiled by David B. Marshall, a senior staff specialist in the Endangered Species Program, and for the first time documents the current status of native birds. The summary shows the high proportion of birds that have become extinct and the large number that are presently Endangered or Threatened. The chart is intended to illustrate the critical status of Hawaii's unique avifauna.*

In an attempt to reduce rat infestations of sugarcane plantations, the Indian mongoose was introduced in 1883. The mongoose did not exterminate the rats, but it did become a serious predator of native ducks and geese.

The islands' ecology was further disrupted by the introduction of more than 50 species of birds and animals, including deer which were imported for hunting. Moreover, in recent years, native forest land has been cleared and replaced with foreign tree species considered to be of greater timber value.

### Disaster on Laysan

Perhaps the single most dramatic environmental tragedy occurred over a 20-year period on the Leeward island of Laysan, to the northwest of the main islands. There, the mining of guano indirectly brought about the extinction of three bird species. When the guano played out in 1904, the mining manager, Captain Max Schlemmer, stayed on and imported rabbits as a business venture, allowing them to run wild.

The rabbits soon overran the island, eating almost all the vegetation and turning the island into a desert. By 1923, when Laysan was visited by a U.S. Biological Survey team, the Laysan millerbird and the Laysan rail (a unique, flightless bird), which had both nested in the tall grass, were gone. Members of the survey team took pictures of the last three Laysan honey-eaters just before they died in a sand storm, an event recorded in writing by team member Alexander Wetmore, who is now with the Smithsonian Institution.

Wetmore and the others had the unenviable distinction of being among the few people ever to witness the extinction of a species in the wild.

### Emphasis on Kauai

A total of 10 of the 29 Endangered endemic species of Hawaiian birds occur on the island of Kauai. They include 4 wetlands and 6 forest birds.

One of the forest birds is the oo, which now numbers only a few dozen and is the last of its kind. Races of oo formerly

(continued on back page)

# THE BIRDS OF HAWAII: ENDEMICS, INDIGENOUS, AND MIGRATORY SPECIES

Compiled by David B. Marshall, *Endangered Species Program*

| Family/Common Name | Scientific Name | Status | Distribution (by island) |
|---|---|---|---|
| **ENDEMICS: Eleven families containing 44 species (with subspecies, a total of 67 taxa)** | | | |
| ANATIDAE | | | |
| Nene (Hawaiian goose) | *Branta sandvicensis* | Endangered | Hawaii, introduced Maui |
| Koloa (Hawaiian duck) | *Anas wyvilliana* | Endangered | Originally all main Islands except Lanai and Kahooiawe; now Kauai only |
| Laysan duck | *Anas laysanensis* | Endangered | Laysan |
| ACCIPITRIDAE | | | |
| Io (Hawaiian hawk) | *Buteo solitarius* | Endangered | Hawaii |
| RALLIDAE | | | |
| Laysan rail | *Porzanula palmeri* | Extinct | Laysan; introduced Midway, where established until release of rats |
| Hawaiian rail | *Pennula sandvicensis* | Extinct | Hawaii and Molokai |
| Hawaiian gallinuie | *Gallinula chloropus sandvicensis* | Endangered | Formerly all main islands except Niihau and Lanai; now Kauai, Oahu, and Molokai |
| Hawaiian coot | *Fulica americana alai* | Endangered | All main islands except Lanai |
| RECURVIROSTRIADE | | | |
| Hawaiian stilt | *Himantopus himantopus knudseni* | Endangered | Niihau, Kauai, Oahu, Molokai, Maui, Hawaii |
| STRIGIDAE | | | |
| Pueo (short-eared owl) | *Asio flammeus sandwichensis* | | All main islands |
| CORVIDAE | | | |
| Alala (Hawaiian crow) | *Corvus tropicus* | Endangered | Hawaii |
| TURDIDAE | | | |
| Omao (Hawaiian thrush) | *Phaeornis obscurus* | | |
| Oahu race | *P.o. oahensis* | Extinct | Oahu |
| Lanai race | *P.o. lanaiensis* | Extinct | Lanai |
| Molokai race | *P.o. rutha* | Endangered | Molokai |
| Kauai race (large Kauai thrush) | *P.o. myadestina* | Endangered | Kauai |
| Hawaii race | *P.o. obscurus* | | Hawaii |
| Puaiohi (small Kauai thrush) | *P. palmeri* | Endangered | Kauai |
| SYLVIIDAE | | | |
| Laysan millerbird | *Acrocephalus familiaris* | Extinct | Laysan |
| Nlhoa mllerbird | *Acrocephalus kingi* | Endangered | Nihoa |
| MUSCICAPIDAE | | | |
| Elepaio | *Chasiempis sandwichensis* | | |
| Kauai race | *C.s. sclateri* | | Kauai |
| Oahu race | *C.s. gayi* | | Oahu |
| Hawaii race | *C.s. sandwichensis* | | Hawaii |
| MELIPHAGIDAE | | | |
| Kauai oo | *Moho braccatus* | Endangered | Kauai |
| Oahu oo | *Moho apicalis* | Extinct | Oahu |
| Molokai oo | *Moho bishopi* | Extinct | Molokai |
| Hawaii oo | *Moho nobiiis* | Extinct | Hawaii |
| Kioea | *Chaetoptila angustipluma* | Extinct | Hawaii |
| DREPANIDIDAE | | | |
| Amakihl | *Loxops virens* | | |
| Kauai race | *L.v. stejnegeri* | | Kauai |
| Oahu race | *L.v. chloris* | | Oahu |
| Maui, Molokai, Lanai race | *L.v. wilsoni* | | Maui, Molokai, Lanai |
| Hawaii race | *L.v. virens* | | Hawaii |
| Anianiau | *Loxops parva* | | Kauai |
| Greater amakihi | *Loxops sagittirostris* | Extinct | Hawaii |
| Creeper | *Loxops maculata* | | |
| Kauai race | *L.m. bairdi* | | Kauai |
| Oahu race | *L.m. macuiata* | Endangered | Oahu |
| Molokai race | *L.m. flammea* | Endangered | Molokai |
| Lanai race | *L.m. montana* | Extinct | Lanai |
| Maui race | *L.m. newtoni* | | Maui |
| Hawaii race | *L.m. mana* | Endangered | Hawaii |

| Family/Common Name | Scientific Name | Status | Distribution (by island) |
|---|---|---|---|
| Akepa | *Loxops coccinea* | | |
| Kauai race | *L.c. caeruleirostris* | | Kauai |
| Oahu race | *L.c. rufa* | Extinct | Oahu |
| Maui race | *L.c. ochracea* | Endangered | Maui |
| Hawaii race | *L.c. coccinea* | Endangered | Hawaii |
| Akialoa | *Hemignathus obscurus* | | |
| Oahu race | *H.o. ellisianus* | Extinct | Oahu |
| Lanai race | *H.o. lanaiensis* | Extinct | Lanai |
| Hawaii race | *H.o. obscurus* | Presumed extinct | Hawaii |
| Kauai akaloa | *Hemignathus procerus* | Endangered | Kauai |
| Nukupuu | *Hemignathus lucidus* | | |
| Kauai race | *H.l. hanapepe* | Endangered | Kauai |
| Oahu race | *H.i. lucidus* | Extinct | Oahu |
| Maui race | *H.i. affinis* | Endangered | Maui |
| Akiapolaau | *Hemignathus wilsoni* | Endangered | Hawaii |
| Maui parrotbill | *Pseudonestor xanthophrys* | Endangered | Maui |
| Ou | *Psittrostra psittacea* | Endangered | Kauai, Hawaii (formerly Oahu, Molokai, Lanai, Maui) |
| Laysan and Nihoa finches | *Psittrostra cantans* | | |
| Laysan finch | *P.c. cantans* | Endangered | Laysan; introduced Midway and Pearl and Hermes Reef, (gone on Midway now because of rats) |
| Nihoa finch | *P.c. ultima* | Endangered | Nihoa; introduced French Frigate Shoals |
| Palila | *Psittrostra bailleui* | Endangered | Hawaii |
| Greater koa finch | *Psittrostra palmeri* | Extinct | Hawaii |
| Lesser koa finch | *Psittrostra flaviceps* | Extinct | Hawaii |
| Grosbeak finch | *Psittrostra kona* | Extinct | Hawaii |
| Poo-uli | *Melamprosops phaesoma* | Endangered | Maui |
| Apapane | *Himatione sanguinea* | | |
| Apapane | *H.s. sanguinea* | | All six main islands |
| Laysan honeyeater | *H.s. freethii* | Extinct | Laysan |
| Crested honeycreeper | *Palmeria doiei* | Endangered | Maui, Molokai |
| Ula-ai-hawane | *Ciridops anna* | Extinct | Hawaii |
| Iiwi | *Vestiaria coccinea* | | Kauai, Oahu, Molokai, Maui, Hawaii; extirpated Lanai |
| Mamo | *Drepanis pacifica* | Extinct | Hawaii |
| Black mamo | *Drepanis funerea* | Extinct | Molokai |

## INDIGENOUS SPECIES: Eight families containing 23 species[1]

| | | |
|---|---|---|
| DIOMEDEIDAE | | |
| Black-footed albatross[2] | *Diomedea nigripes* | |
| Laysan albatross[2] | *Diomedea immutabllis* | |
| PROCELLARIIDAE | | |
| Wedge-tailed shearwater | *Puffinus pacificus chlorohynchus* | |
| Christmas shearwater | *Puffinis nativitatus* | |
| Newell's shearwater[2] | *Puffinis puffinus newelli* | Threatened |
| Dark-rumped petrel[2] | *Pterodroma phaeopygia sandwichensis* | Endangered |
| Bonin petrel | *Pterodroma hypoleuca sandwichensis* | |
| Bulwer's petrel | *Bulweria bulwerii* | |
| HYDROBATIDAE | | |
| Harcourt's storm petrel[3] | *Oceanodroma castro cryptoleucura* | |
| Sooty storm petrel | *Oceanodroma tristrami* | |
| PHAETHONTIDAE | | |
| White-tailed tropicbird[2] | *Phaethon lepturus dorotheae* | |
| Red-tailed tropicbird | *Phaethon rubricauda rothschildi* | |
| SULIDAE | | |
| Blue-faced booby | *Sula dactylatra personata* | |
| Brown booby | *Sula leucogaster plotus* | |
| Red-footed booby | *Sula sula rubripes* | |
| FREGATIDAE | | |
| Great frigatebird | *Fregata minor palmerstonl* | |
| LARIDAE | | |
| Sooty tern | *Sterna fuscata oahuensis* | |
| Gray-backed tern | *Sterna lunata* | |
| Blue-gray noddy | *Procelsterna cerulea saxatilis* | |
| Common noddy (brown noddy) | *Anous stolidus pileatus* | |
| White-capped noddy | *Anous tenuitoatria* | |
| White tern | *Gygis alba* | |
| ARDEIDAE | | |
| Black-crowned night heron | *Nycticorax nycticorax hoactli* | |

[1] Most of these indigenous birds nest either on Leeward Islands or islands offshore from main islands; they feed at sea.
[2] Nests exclusively in Hawaiian Islands.
[3] This subspecies was once listed as Endangered, but was removed on basis of its not being a valid subspecies by John Aldrich. It could be listed as an endangered population.

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## REGULAR MIGRANTS: A total of 11 species

| | |
|---|---|
| Pale-footed shearwater | Golden plover |
| Pintail | Black-bellied plover |
| American widgeon | Ruddy turnstone |
| Shoveler | Bristle-thighed curlew |
| Lesser scaup | Wandering tattler |
| Sanderling | |

## TOTALS BY MAJOR CATEGORY

| Major Category | Extinct | Endangered | Neither | Total |
|---|---|---|---|---|
| Endemic Species (occur only in Hawaiian Islands) | 15 | 20 | 9 | 44 |
| (Endemic Species and Subspecies) | (23) | (29) | (15) | (67) |
| Indigenous Species (occur in Hawaiian Islands and other areas or open ocean) | 0 | 1 | 22 | 23 |
| Regular Migrants | 0 | 0 | 11 | 11 |
| Introduced and Established Species (approximate number) | 0 | 0 | 50 | 50 |
| Total | 15 | 21 | 92 | 151 |

**Sources:**
1. Andrew J. Berger, **Hawaiian Birdlife** (Honolulu: The University Press of Hawaii)
2. Tonnie L. C. Casey and James D. Jacobi, "A New Genus and Species of Bird from the Island of Maui, Hawaii, (Passerformes: Drepanididae)," Occasional Papers of Bernice P. Bishop Museum, Honolulu, Hawaii, Vol. 24, No. 12, August 2, 1974.
3. U.S. Fish and Wildlife Service Official List of Endangered Species.

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existed on Oahu, Molokai, and Hawaii, but all are now presumed to be extinct.

The oo has puffs of yellow feathers on its sides, which were prized in the early days as materials for making helmets and cloaks for Hawaiian chiefs. Hundreds of birds had to be sacrificed to make a single cloak.

The puaiohi, or small Kauai thrush, is found only in Kauai's Alakai Swamp.

### Research and Recovery

For the past several years, the Patuxent Wildlife Research Center, in Maryland, has been directing population and distribution surveys of Hawaiian bird life. These surveys are being conducted with the help of Federal and State agencies and private institutions.

The Endangered Species Program has fielded in Hawaii nine recovery teams covering 22 Endangered forest birds and waterbirds. New refuges for Endangered birds have been established, or are proposed, on the islands of Kauai, Oahu, Maui, Molokai, and Hawaii. In addition, the National Park Service is protecting certain other species in Haleakala National Park on Maui and in Hawaii Volcanoes National Park on Hawaii. State forests and refuges play a vital role in protecting habitat.

A considerable research effort is being concentrated on the island of Hawaii, where 9 of 21 native bird species have become extinct and 6 of the remaining species are Endangered. A survey of forest birds conducted this summer turned up larger numbers of akepa and creepers than had been expected. However, the count of the io, or Hawaiian hawk, and of the alala, or Hawaiian crow, was low. It is believed there are less than 50 alala left.

About 20 years ago, the population of the nene, or Hawaiian goose, had declined to less than 100. However, because of an artificial propagation program undertaken by the State Division of Fish and Game and supported by the Wildfowl Trust of England, the nene has recovered to the point where the total population now numbers more than 600.

One type of recovery effort involves purchase of key wetlands in order to protect the habitat of certain Endangered species. Such purchases have resulted in an improved outlook for the koloa, or Hawaiian duck, which now numbers about 3,000, as well as for the Hawaiian coot, the Hawaiian stilt, and the Hawaiian gallinule.

The Fish and Wildlife Service is also concerned about the bird species that live on the small islands and atolls that lie to the northwest of the main islands and comprise the Hawaiian Islands National Wildlife Refuge. Current recovery efforts, for example, are aimed at preserving the Laysan finch, which survived after the other land birds were wiped out with the vegetation, and the Laysan duck, the numbers of which have fluctuated drastically in recent years. Similar efforts are also being made on behalf of the Nihoa millerbird and Nihoa finch.

U.S. Fish and Wildlife Service photo.

*The Laysan Duck, a fluctuating population*

## FINAL RULEMAKING ON PRIMATES

| Common Name | Scientific Name | Distribution | Listed Status |
|---|---|---|---|
| **Asian Primates** | | | |
| Francois' leaf monkey | *Presbytis francoisi* | Indochina | Endangered |
| Lesser slow loris | *Nycticebus pygmaeus* | Indochina | Threatened |
| Tonkin snub-nosed monkey | *Rhinopithecus avunculus* | N. Vietnam | Threatened |
| Stumptail macaque | *Macaca arctoides* | Indochina/Malay Peninsula/India | Threatened |
| Philipine tarsier | *Tarsius syrichta* | Philippines | Threatened |
| Formosan rock macaque | *Macaca cyclopis* | Taiwan | Threatened |
| Japanese macaque | *Macaca fuscata* | Japan | Threatened |
| Toque macaque | *Macaca sinica* | Sri Lanka | Threatened |
| Purple-faced langur | *Presbytis senex* | Sri Lanka | Threatened |
| Long-tailed langur | *Presbytis potenzani* | Indonesia | Threatened |
| **African Primates** | | | |
| Diana monkey | *Ceropithecus diana* | West Africa | Endangered |
| Red-eared nose-spotted monkey | *Cercopithecus erythrotis* | Nigeria | Endangered |
| Red-bellied monkey | *Cercopithecus erythrogaster* | Nigeria | Endangered |
| L'hoest's monkey | *Cercopithecus lhoesti* | Cameroon/Nigeria | Endangered |
| White-collared mangabey | *Cercocebus torquatus* | Senegal/Ghana Nigeria/Gabon | Endangered |
| Black colobus | *Colobus satanas* | Cameroon/Guinea Gabon/Zaire | Endangered |
| Mandrill | *Papio sphinx* | West Africa | Endangered |
| Drill | *Papio leucophaeus* | Cameroon/Nigeria | Endangered |
| Gelada baboon | *Theropithecus gelada* | Ethiopia | Threatened |
| Chimpanzee | *Pan troglodytes* | West-central Africa | Threatened |
| Pigmy chimpanzee | *Pan paniscus* | Zaire | Threatened |
| **Latin American Primates** | | | |
| Cotton-top marmoset | *Saguinus oedipus* | Panama/Costa Rica | Endangered |
| Pied tamarin | *Saguinus bicolor* | Brazil | Endangered |
| Yellow-tailed wooly monkey | *Lagothrix flavicauda* | Peru | Endangered |
| White-footed tamarin | *Saguinus leucopus* | Colombia | Threatened |
| Black howler monkey | *Alouatta pigra* | Mexico | Threatened |

## BOX SCORE OF SPECIES LISTINGS

| Category | Number of Endangered Species | | | Number of Threatened Species | | |
|---|---|---|---|---|---|---|
| | U.S. | Foreign | Total | U.S. | Foreign | Total |
| Mammals | 35 | 227 | 262 | 1 | 17 | 18 |
| Birds | 65 | 144 | 209 | 1 | | 1 |
| Reptiles | 8 | 46 | 54 | | | |
| Amphibians | 4 | 9 | 13 | | | |
| Fishes | 30 | 10 | 40 | 4 | | 4 |
| Snails | | 1 | 1 | | | |
| Clams | 22 | 2 | 24 | | | |
| Crustaceans | | | | | | |
| Insects | 6 | | 6 | 2 | | 2 |
| Plants | | | | | | |
| Total | 170 | 439 | 609 | 8 | 17 | 25 |

Number of species currently proposed: 47 animals
1850 plants (approx.)
Number of Critical Habitats proposed: 7
Number of Critical Habitats listed: 5
Number of Recovery Teams appointed: 57
Number of Recovery Plans approved: 4
Number of Cooperative Agreements signed with States: 15

GPO 909-710

## Primates (continued from page 1)

### Special Provisions

Taking advantage of the flexibility provided by the Endangered Species Act of 1973 for management of Threatened species, the rulemaking excludes captive individuals of the fourteen Threatened primates from the prohibitions of section 9 of the act.

Section 9 bans import, export, capture, killing, harassment, interstate commerce, and sale, and offering for sale. These prohibitions are mandatory for Endangered species and optional for Threatened species.

As incorporated into the rulemaking, this exclusion applies to individual animals in captivity on November 18, 1976, their progeny, and individual animals legally imported into the United States after November 18, 1976—so long as there is satisfactory documentation of each animal's captive status, birth in captivity, or legal importation.

"Satisfactory documentation" includes such evidence as records in the International Species Inventory System (ISIS); Federal, State, or local government permits; and notarized studbooks and inventories.

### Special Case: Squirrel Monkey

Data to support the Endangered and Threatened status determinations for primates were developed in a comprehensive report prepared under contract for the Endangered Species Program. The aim of this report was to explore the status of each of the world's primates.

Subsequently twenty-seven species were proposed for listing (F.R. 4/19/76). However, the final rulemaking omitted one of these species. The squirrel monkey was dropped because a substantial amount of data was received from scientific and medical research institutions indicating that this species may not qualify for either Endangered or Threatened status. Consequently action on the squirrel monkey was deferred to permit detailed evaluation of this new information.

## Survey Shows Hawaiian Coots and Stilts Holding Their Own

The annual survey of the Hawaiian coot **(Fulica americana alai)** and the Hawaiian stilt **(Himantopus himantopus knudseni)** shows that each of these Endangered species continues to hold its own.

Conducted in August by the Fish and Wildlife Service, the survey yielded 1,976 coots and 1,479 stilts.

The total for the coot, which is found mostly on the island of Kauai, was 384 less than for 1975 but over 700 more than the nine-year average of 1,253.

The total for the stilt, found mostly on the islands of Oahu and Maui, was 3 more than for last year and about 250 more than the nine-year average of 1,225.

# SECOND STAGE OF CONDOR BREEDING PROGRAM NEARS COMPLETION

The Service's long-term experimental breeding program for the Andean condor **(Vultur gryphus)** has progressed to the point where three of the four pairs of adult birds are now breeding.

These three pairs have produced four surviving young over the past three years, and the program researchers now think it realistic to expect a yield of two-to-four young each year.

Inducing the condors to breed successfully in captivity represents the second stage of the three-stage program being conducted at the Service's Patuxent Wildlife Research Center, located in Laurel, Md.

The program was begun in 1966 as a surrogate research project in support of efforts aimed at recovery of the critically endangered California condor **(Gymnogyps californianus).**

It was decided to focus this project solely on the feasibility of propagation and not to explore the biological problems relating to the advisability of taking California condors into captivity for breeding purposes.

The Patuxent researchers conceived the program as a three-stage undertaking. The three stages were identified as follows:

(1) capture of the birds and then their housing and care in captivity

(2) inducement of successful breeding while in captivity

(3) transplantation of the captivity-reared birds to the wild

*Andean condors in breeding pen at Patuxent* U.S. Fish and Wildlife Service photo.

### First Stage

Nine immature birds were captured in the Andean region of Argentina in 1966 and 1967. One of these birds died of aspergillosis and lead poisoning soon after its arrival at Patuxent.

The eight other birds survived. They were kept in a community pen until 1971, when the researchers started pairing the birds reaching adulthood.

The pairing of the birds was facilitated by the strong sexual dimorphism of the species, males being easily distinguished from females by their distinctive eye color and also their fleshy crest or caruncle.

The paired birds were placed in separate, limited-flight enclosures, each of which was 40 feet square and 17 feet high. The enclosures contained elevated perches, as well as covered, four-by-six-foot roost/nest compartments floored with a two-inch-thick layer of sand.

### Second Stage

Egg laying began the same year, 1971, when one set of paired birds produced one fertile egg. This pair also produced an egg in each of the three succeeding years. Their 1973 egg was the first to hatch; the result was the program's first surviving chick.

In the wild, Andean condors reproduce only every other year. The probable reason for this slow rate is the lengthy period of parental care afforded each offspring. At Patuxent, however, researchers achieved annual reproduction simply by removing the young from the parents' enclosure before the onset of the next breeding season.

This method was first tested when the 1973 chick was deliberately left in the enclosure. As the March 1974 breeding season approached, however, the parents started pecking at the chick whenever it perched close to them. A few days later, they drove it out of sight into a nesting compartment, where it remained until eventually removed by the researchers.

A week later, the pair began breeding. On April 25, they produced an egg. However, they were not as attentive to

(continued on page 2)

ENDANGERED SPECIES TECHNICAL BULLETIN

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